

HUMAN FACTORS SPECIALIST

Key information

Reference: ST0785 Version: 1.0 Level: 7 Degree: integrated degree Typical duration to gateway: 36 months Typical EPA period: 6 months Maximum funding: £19000

Route: Engineering and manufacturing
Date updated: 11/05/2023
Approved for delivery: 11 May 2023
Lars code: 706
EQA provider: Office for Students
Review: This apprenticeship standard will be reviewed after three years

Details of the occupational standard

Occupation summary

This occupation is found in the defence and security, transportation, manufacturing, energy, and healthcare sectors.

The broad purpose of the occupation is to make systems, products, tasks, jobs, organisations and work environments better for their intended users. The occupation is also referred to as Ergonomics and it is broadly accepted that the terms 'ergonomics' and 'human factors' can be used interchangeably. The role involves the application of scientific information about the capabilities of human beings to the design of equipment, working practices, organisations and working environments in order to make people's jobs safer, more efficient and more productive. Human Factors Specialists are found in a broad range of occupational sectors. For example, they may contribute to the design of power plant control rooms in the energy sector in order to minimise the risk of human error. In the defence sector they might contribute to the design of a fast jet cockpit ensuring that the pilot can use all the information, control the systems and make optimal decisions under high pressure. In the transportation sector they may support the design of a railway carriage layout; ensuring the comfort and safe accommodation of passengers. In a manufacturing context, a Human Factors Specialist may be involved in the design of production line processes, including the definition of line workers' tasks and the physical layout of the equipment. Similarly, in the healthcare sector a Human Factors Specialist may be involved in the design of human computer interfaces (HCI) on medical devices such as scanners and X-ray machines. Across all sectors the common aim is to ensure that users of a system or process can perform their tasks safely and effectively, often in demanding and stressful environments.

In their daily work, an employee in this occupation interacts with End Users of systems (e.g. military personnel, pilots, plant operators, radiographers etc.) in order to understand their goals and performance objectives and accommodate features into the design to enable them to achieve these aims. They may also advise experts in specialist fields (such as safety) on the

characteristics of Human Performance in given situations. They are also likely to interact with programme managers, customer representatives, suppliers, colleagues in other business functions (e.g. engineering, legal), researchers and academics, Government agencies and regulators. Their daily work is mainly office based with occasional laboratory or field based trials and offsite visits to industrial sites and offices.

An employee in this occupation will be responsible for leading human factors elements of projects or programmes to create optimum products or processes that meet the needs of the users and ensure the required operational performance. They will be responsible for the application of specialist methodologies, tools and techniques across the full lifecycle of the system (i.e. from initial concepts, through manufacture and in-service phases to disposal). They may work autonomously but are more likely to be part of wider multidisciplinary teams, typically reporting to project or programme leaders or to a head of human factors. They will typically have responsibility for the human factors team budget for each project. The size of the role is project dependent and may vary from providing a short period of expert consultancy to leading a team of human factors professionals on a large development project over a number of years..

Typical job titles include:



Occupation duties

DUTY	KSBS	
Duty 1 Plan, control and deliver human factors activities (e.g. analysis, design and assessment) to meet	K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 K12 K13 K14 K15 K16 K19 K20	
requirements and achieve goals in terms of performance, quality and in accordance with budgets and timescales.	S1 S2 S4 S5 S7 S8 S9 S10 S11 S12 S13 S14	
	B1 B2 B3 B4 B5 B6	
Duty 2 Conduct bid and tendering activities for human factors work ensuring bids meet customer needs and are in alignment with business and commercial criteria.	K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 K12 K13 K14 K15 K16 K17 K18 K19	
	S1 S4 S7 S8 S9 S13 S14	
	B1 B2 B4 B5 B6	
Duty 3 Lead and manage human factors related interactions and communications with end users, other technical disciplines, internal business functions and external agencies (e.g. design workshops and reviews).	K2 K3 K4 K5 K6 K7 K9 K10 K12 K13 K14 K15 K17 K18 K19 K20	
	S1 S5 S7 S8 S11 S12 S13 S15	
	B1 B2 B3 B4 B5 B6	
Duty 4 Identify and manage human factors considerations (e.g. personnel capability, equipment suitability, human performance influencers) in order to determine the appropriate methodologies, tools and standards required to address any human-related risks, issues or opportunities identified with systems, products, tasks, jobs, organisations or environments.	K1 K2 K3 K4 K5 K6 K7 K9 K10 K11	
	K12 K13 K14 K19	
	S1 S4 S7 S8 S10 S13	
	B1 B2 B4 B5 B6	
Duty 5 Analyse human roles (e.g. aircraft pilot, control room operator, vehicle maintainer) in order to establish	K1 K2 K3 K4 K5 K6 K7 K11 K12 K18 K19	
current and future expectations of the end user and demands they may create for the systems, products, jobs, organisations and environments.	S1 S2 S4 S5 S6 S7 S12 S13	
	B1 B2 B3 B4 B5 B6	
Duty 6 Support the development of safety systems and processes to ensure adequate protection of people, infrastructure and the environment.	K1 K2 K3 K4 K5 K6 K7 K9 K10 K18	
	S1 S2 S3 S4 S5 S6 S7 S10 S12 S13	
	B1 B2 B3 B4 B5 B6	
Duty 7 Specify and manage human factors	K1 K9 K10 K12 K19	
requirements for equipment, systems, products, tasks, jobs, organisations and environments in accordance	S2 S3 S4 S5 S7 S9 S13	
	B1 B2 B3 B4 B5 B6	

with human factors principles, best practice and applicable regulations and standards. **Duty 8** Contribute to the design of equipment, systems, K1 K2 K3 K4 K5 K6 K7 K9 K10 K12 products, tasks, jobs, organisations and environments K18 K19 (e.g. power plant control room, an armoured fighting S1 S2 S3 S4 S5 S7 S10 S12 S13 vehicle, an aircraft cockpit or a medical device) in accordance with requirements, human factors B1 B2 B3 B4 B5 B6 principles, best practice and applicable regulations and standards. Duty 9 Assess the performance and integration of K1 K2 K3 K4 K5 K6 K7 K8 K10 K12 humans in systems, products, tasks, jobs, organisations K15 K17 K18 K19 and environments (e.g. how an aircraft pilot performs S1 S2 S5 S6 S7 S10 S12 S13 S14 in an aircraft simulator representing a new design) to verify and validate the design against human factors B1 B2 B3 B4 B5 B6 requirements. **Duty 10** Provide human factors evidence to support K1 K2 K3 K4 K5 K6 K7 K9 K10 K13 the assurance and acceptance of new or updated K17 systems, products, tasks, jobs, organisations and S1 S5 S6 S7 S9 S13 environments. B1 B2 B3 B4 B5 B6 **Duty 11** Plan, conduct and apply research to support K1 K2 K3 K4 K5 K6 K7 K10 K11 K12 better understanding of human factors related risks K18 K19 K20 (e.g. managing operator cognitive load) and issues S1 S2 S4 S5 S7 S9 S13 throughout the system (product, task, job, organisational structure or environment) lifecycle (from B1 B2 B3 B4 B5 B6 concept to disposal). K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 Duty 12 Maintain an ongoing continuous professional development programme. K12 K13 K14 K15 K16 K18 S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 B1 B2 B3 B4 B5 B6 B7

KSBs Knowledge

K1: The theoretical application of human sciences to the engineering and design of products, processes, and systems based on relevant parts of psychology, physiology, human biology, biomechanics and cognitive science.

K2: Numerical, analytical and critical analysis techniques for Human-System Analysis & Assessment. The limitations of these techniques.

K3: Qualitative and quantitative approaches and techniques for user engagement.

K4: Design principles, methods and limitations for systems design and sociotechnical system design.

K5: Human factors principles for Human Machine Interface (HMI) design.

K6: Capability and limitations in the design and evaluation of physical ergonomics.

K7: Robotic Intelligent and Autonomous Systems (RIAS) and their Human Factors considerations.

K8: Principles of Human Factors Integration and Human System Integration.

K9: National and international human factors standards and supporting guidance.

K10: Legal requirements: statutory and national, international and sector specific legislation and regulation.

K11: Research design; ethical and environmental practice in research and qualitative and quantitative approaches to research.

K12: The principles and processes of Human Centred Design.

K13: Product, service and system lifecycles: planning, developing, preparing, utilising and retirement.

K14: Project management techniques for project delivery: planning, resource management, cost and budget control, risk, and quality.

K15: Teamwork and leadership: negotiation techniques, conflict management, development techniques, and diversity, equality and inclusivity considerations.

K16: Time management techniques.

K17: Communication techniques: oral, written, and presentations.

K18: The implication of the broader business and engineering context including safety, environmental protection and sustainability, ethics, economic responsibility, social responsibilities, and advances in technology on human factors.

K19: Inclusive and accessible design principles and practice.

K20: Techniques for user trials and experimentation appropriate to human factors design.

Skills

S1: Select and apply human factors methodologies to project requirements.

S2: Use computer-based tools to assist in the design, analysis, evaluation and validation of jobs, interfaces, tasks and environments such as: Computer Aided Design, Task Analysis, Anthropometric Modelling, Workload Analysis, HCI/User Interface Design and Prototyping.

S3: Produce Specific-Measurable-Appropriate-Realistic-Timebound (SMART) requirements.

S4: Identify and comply with legal, statutory and any other relevant legislation and standards to bound and inform design and engineering choices.

S5: Design and execute trials and experimentation involving Users.

S6: Collect, analyse and interpret data using numerical, analytical and critical analysis techniques.

S7: Communicate with colleagues and stakeholders in multidisciplinary teams using different methods including oral, written, and presentation.

S8: Plan, manage and lead projects.

S9: Produce documentation such as assessments, risk registers, plans, specifications and assurance cases.

S10: Plan and undertake research to meet the project requirement.

S11: Technical decision making related to human factors engineering considering the impact on the project and area of delegated authority.

S12: Use human factors design principles when developing solutions.

S13: Plan and manage own time.

S14: Integrate human factors programme of work within engineering programmes.

S15: Teamwork and leadership skills including: negotiation techniques, conflict management, development techniques, and diversity, equality and inclusivity considerations.

Behaviours

B1: Adapt and is resilient to challenging or changing situations.

B2: Act in a professional and ethical manner.

B3: Lead by example and act as an advocate for human centred and inclusive design practices.

B4: Prioritise quality and continuous improvement practices.

B5: Lead by example to promote innovation and challenge existing practices.

B6: Collaborate and promote teamwork across disciplines.

B7: Commit to ongoing professional development.

Qualifications

English and Maths

Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

Other mandatory qualifications

Masters degree in human factors

Level: 7 (integrated degree)

Professional recognition

This standard aligns with the following professional recognition:

• Graduate Member for Chartered Institute of Ergonomics and Human Factors (CIEHF)

Version log

Version	Change detail	Earliest start date	Latest start date	Latest end date
1.0	Approved for delivery	11/05/2023	Not set	Not set

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